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NEW SPECIES OF EMPHYTINAE AND SELANDRIINAE—HYMENOPTERA.

By Alex. D. MacGillivray,

University of Illinois, Urbana, Ill.

The adults of the following new species of Tenthredinidæ were all bred from larvæ. The specimens from New York were collected and bred by Dr. H. Yuasa, and the Maine specimens by the Maine Agricultural Experiment Station at Orono.

Strongylogastroidea depressata sp. nov.

Female. Body black with the following parts whitish: labrum, tegulæ, procoxæ, mesocoxæ, spot on metacoxæ, and trochanters; with the following parts rufous: mandibles, angles of clypeus, distal three or four segments of the antennæ, legs beyond the trochanters except the metatarsi which are fuscous to black, abdominal segments three and four, terga and sterna, and saw-guides in great part; third segment of antennæ distinctly longer than fourth and not as long as fourth and fifth together; clypeus very shallowly emarginate; ocellar basin deep with vertical walls, surrounding median ocellus, extending between antacoriæ; median fovea obscure; surface of ocellar basin and its bounding walls finely punctate; postocellar area polished; mesoscutellum with lateral portions coarsely punctate; saw-guides with dorsal margin concave and ventral margin convex, distal end bluntly rounded; wings hyaline; veins including costa pale, stigma infuscated. Length 7 mm.

Habitat: Orono, Maine. Sub. 39.

This species is similar to *unicincta* Nort. The black collar, the pale femora, and the difference in the saw-guides will separate them.

Emphytus yuasi sp. nov.

Female. Body black with the following parts white: clypeus, labrum, mandibles in great part, tegulæ, collar, ventral half of mesopleuræ and extending over mesosternum, coxae, trochanters, femora except distal ends of mesofemora and metafemora, more or less suffused with rufous, tibiæ except narrow band on caudal margin and a ring at the distal end, protarsi and mesotarsi except narrow band on caudal margin, narrow band on proximal end of basitarsi of metatarsi, ventral aspect of abdomen, and caudal tergum except at sides; mesal portion of terga with a yellowish mark, largest on second to fifth, extending along caudal margin; clypeus deeply squarely emarginate; third segment of antennæ distinctly longer than fourth; antennal furrows broadly rounded, indistinct; ocellar area elevated, ocellar basin a rounded furrow; median fovea indistinct; head punctate below lateral ocelli; oblique depression extending from lateral ocelli toward compound eye; mesonotum polished; wings hyaline, costal and proximal spot on stigma yellowish, veins and stigma black; saw-guides convex on dorsal and ventral margins, distal end obliquely rounded. Length 6.5 mm.

Habitat: Ithaca, New York. No. 171-1.

This species is similar to *apertus* Nort., but the difference in the length of the third segment of the antennæ will separate them.

Unitaxonus Gen. nov.

Front wings with the radial and radio-medial cross-veins distinct, free part of subcosta one apparently wanting, free part of second anal vein present, slightly oblique, located some distance nearer the proximal end of the wing than media four plus cubitus one; hind wings with the free part of radius four and the transverse part of media two wanting, the second anal cell petiolate; antennæ with nine segments; clypeus nearly truncate in the female; the basitarsus of each metatarsus about subequal in length to the four following segments. Type, *Unitaxonus repentinus* MacG.

Unitaxonus repentinus sp. nov.

Female. Body black with the following parts rufous; mandibles, femora, tibiæ, protarsi, mesotarsi, and abdominal segments two to four, including terga and sterna; with the following parts whitish: labrum, tegulæ, procoxæ, distal portion of mesocoxæ, and trochanters; antennæ with third segment distinctly longer than fourth; clypeus faintly broadly emarginate, almost truncate; supraclypeal area elevated; median fovea broad, shallow, almost obsolete; ocellar basin oval, not deep; head including postocellar area polished; median and lateral lobes of the mesonotum polished, mesocutellum in part punctate; wings slightly infuscated, stigma and costa yellowish infuscated, veins black; saw-guides with dorsal margin straight, ventral margin convex, converging toward distal end, distal end truncately rounded. Length 7 mm.

Habitat: Ithaca, New York. No. 129-1-2.

The male differs only in having the clypeus more deeply emarginate, limited on each side by slight projections and the bottom of the emargination straight.

Unitaxonus rumicis spec. nov.

Female. Body black with the following parts rufous: labrum, mandibles, distal two-thirds to one-half of coxæ, trochanters, femora, tibiæ, protarsi, mesotarsi, and abdominal segments two to four; third segment of antennæ nearly twice as long as the fourth; clypeus only slightly emarginate; median fovea wanting; ocellar basin oval, deep, surrounding median ocellus, limited at ventral end by a round flat area between antacoriæ; head polished; median and lateral lobes of mesonotum polished; mesopleuræ densely setaceous and finely punctate; wings infuscated, costa pale, veins and stigma black; saw-guides with margins straight and distal end broadly bluntly rounded. Length 8 mm.

Habitat: Ithaca, New York. No. 91-2-1.

The length of the third antennal segment and the shape of the saw-guides will separate this species from *repentinus* MacG. Described from a single specimen in poor condition.

Empria cetaria sp. nov.

Female. Body black with the following parts white: labrum, tegulæ, and legs except proximal two-thirds of coxæ, distal third of metafemora, and distal end of metatibæ; metatarsi infuscated; head polished, densely setaceous, punctate with numerous fine calices; clypeus flat, squarely shallowly emarginate, lateral projecting angles bluntly pointed; ocellar basin a shallow shield-shaped depression including median ocellus; median fovea very minute, slight pit-like depression at ventral end of ocellar basin; antennæ with segments four and five subequal, three distinctly longer than four and not as long as four and five together; head with a convex ridge between antennal furrows; ocellar and interocellar furrows obsolete; mesonotum polished, mesoscutellum with caudal half punctured; saw-guides with dorsal margin concave, ventral margin convex, converging toward bluntly rounded distal end; wings hyaline, veins, costa, and stigma brownish. Length 6 mm.

Habitat: Ithaca, New York. No. 119-1-2.

This species is related to *celsa* MacG., from which it can be differentiated by lack of ocellar and interocellar furrows.

Empria cerina sp. nov.

Female. Body black with the following parts white: labrum in part, collar narrowly, tegulæ, distal ends of femora, protibiæ, mesotibiæ, proximal and distal ends of metatibiæ, proximal end broader than distal, protarsi, and proximal portion of mesobasitarsi; clypeus with a fine mesal ridge and tooth, ventral margin narrow, emargination shallow; antennæ with third and fourth segments subequal, short; ocellar basin shallow, extending between antacoriæ and bearing pit-like median fovea and median ocellus, latter bounded by distinct Y-shaped furrow; ocellar and interocellar furrows distinct; antennal furrows interrupted near middle; postocellar area broader than long; median and lateral lobes of mesonotum polished; mesocutellum finely punctate; wings hyaline; veins brownish, costa and stigma infuscated; saw-guides with dorsal margin straight, ventral margin convex, rapidly converging to obliquely, bluntly pointed distal end. Length 6 mm.

Habitat: Ithaca, New York. No. 107-5-2 and 107-3.

This species can be separated from *cauduca* MacG. by the shallow emargination of the clypeus and the form of the median fovea.

Thrinax pullatus sp. nov.

Male. Body black with the following parts rufous: collar narrowly, trochanters, femora, tibiæ, and tarsi except two or three distal segments of the metatarsi; abdominal terga with caudal portion with a narrow linear yellowish or rufous margin; antennae with third and fourth segments subequal; labrum densely setaceous; clypeus broadly, roundly, shallowly emarginate; median fovea punctiform; ocellar basin broadly limited by a distinct frontal crest, surrounding the median ocellus; antennal furrows obscure, interrupted near middle of their length; vertical furrows deep, broad, longer than broad; postocellar area with a deep mesal furrow connecting with shallow inconspicuous ocellar furrow; surface of head dull; mesonotum dull, indefinitely punctate or striate; mesoscutellum with distinct furrows on each side, polished on meson; metascutellum polished, impunctuate; mesopleura dull, sparsely sericeous; cerci distinct, short, porrect; caudal margin of caudal sternum rounded; wings hyaline, costa reddish, veins and stigma infuscated. Lenth 8 mm.

Habitat: Ithaca, New York. No. 20-1.

The general appearance of this species, the arrangement of the pale color and the line of the abdominal segments is similar to that of *Strongylogaster politus* Prov. The difference in the coloration of the abdomen will differentiate it from *Thrinax impressatus* Prov.

NEW UNITED STATES ZOOCECIDIA.

By B. W. Wells,
State College, Raleigh, North Carolina.

In the descriptions below, the author has indicated in each case whether the gall is a kataplasma or a prosoplasma. These terms of Küster's pertaining to the lower and higher galls respectively, deserve a prominent place in gall descriptions, for they connote very significant conditions. The writer has pointed out (Botanical Gazette, May, 1921) that these groups have an evolutionary relationship. By "kataplasma" Küster means those indefinite galls whose structure is developed through hyperplasia of embryonic tissue, the end product not becoming in its differentiation, orientation and form of tissues, fundamentally different from the normal plant part; they represent inhibitions of the normal differentiations, the more advanced ones thus approach homogenity. "Prosoplasmas," on the other hand, are definite galls whose structure differs fundamentally from the normal plant part, the tissues in their form and orientation characters constituting an aggregation of new qualities.

In presenting these descriptions, it is with the hope that these forms may again be collected and the adult stages of the cecidozoons be obtained.

Not until the descriptions of the adults appear should names be attached to galls; in the present paper the forms have been given a number which can readily be referred to by any future investigator. I should like to here repeat a statement made in an earlier paper: "The custom on the part of some, of applying a specific name to an insect or mite, merely on the basis of the intimately associated gall, is to be deplored."

The familiar "catch-all" generic names have been used in those cases in which the nature of the parasitic organism was determined, viz., "Cecidomyia" for an itonidid form, "Cynips" for a cynipidous form, and "Eriophyes" for a mite gall-maker.

The galls herein described and believed to be heretofore unreported, are arranged on the basis of the plant affected. The plant genera are arranged alphabetically, Gray's Manual being followed in the matter of nomenclature.

Amelanchier

Cecidomyia sp. Cecidium nov. Fig. 1.

1. On *Amelanchier canadensis* (L) Mefic., leaf; prosoplasma, appendicular, diverticulum type; stout balloon-shape with attenuate tip, 3-5 mm. long, 2-3 mm. wide, reddish purple, surface, however, with bloom which gives it a bluish tinge; galls commonly found in groups of two, on under side of leaf, each gall tilted out of the perpendicular position; opening in leaf-blade on side opposite the gall, minute, slit-like with definitely raised lips; cavity small in the broader, distal part connected with opening by a relatively narrow canal, walls thick with rather prominent veins; not common, Cedar Point, O. Types in author's collection.

Cecidomyia sp. Cecidium nov. Fig. 2.

2. On intervenal areas of leaf of *Amelanchier canadensis* (L) Medic. (service berry); prosoplasma, sub-ovid, laterally flattened, the sides paralleling the secondary veins, extending from both sides of the leaf, long axis perpendicular to the blade, 2-3 mm. long,

upper side rounded, yellow or red, lower side truncate with slit-like opening, yellowish, surface smooth; monothalamous, chamber in upper half of gall connected with slit-like opening by narrow, flattened canal, walls firm; locally abundant, Hocking Co., Ohio, Cedar Point, Ohio. Types in collection of author.

Amorpha.

Cecidomyia sp. Cecidium nov. Fig. 3.

3. On *Amorpha canescens* Pursh, leaf rachis, leaflet either side or flower stalks; prosoplasma, up-walled type; cone-shaped with truncate ends, more or less curved, when on leaflet, base projects as a rounded prominence beyond the blade, 4-12 mm. long, larger when on leaf or floral axes, galls of leaflets exposed to light distinctly red in color, pubescence similar to that of normal plant; chamber shape conforms to that of gall; fairly common, numerous on particular plants, Manhattan, Kan. Types in collection of writer.

Cecidomyia sp. Cecidium nov. Fig. 4.

4. On *Amorpha canescens* Pursch, leaflet; kataplasma, edge-roll type; revolute leaf edge, yellow, 3-5 mm. long, pubescent like normal leaf; fairly common, Manhattan, Kan. Types in collection of writer.

Albizzia.

Coccid sp. Cecidium nov. Fig. 5.

5. On *Albizzia julibrissin* Durazzini, stem surface; kataplasma; simple, circular elevations with depression in center containing coccid, 5.8 mm. dia., lighter in color than surrounding bark, the color of the new hyperplastic tissue which has become exposed; locally common, Raleigh, N. C. Types in collection of the writer.

The above gall may be found on stems of widely varying age. It may be formed on trunks measuring 7-8 cm. dia. The figure is from a stem measuring 3 cm. in dia. and which is 7 years old.

Azalea.

Coccid sp. Cecidium nov. Fig. 6.

6. On *Azalea nudiflora* (L) Torr., stem surface; kataplasma; simple diamond-shaped elevations with rounded corners with depression in center containing coccid, 1 cm. long, elevation about

2 mm. above twig surface. Surface of raised portion coarsely striate due to splitting of original epidermis; abundant locally, Raleigh, N. C. Types in collection of the writer.

Castanea.

Cecidomyia sp. Cecidium nov. Fig. 7.

7. On *Castanea pumila* (L) Mill., leaf; prosoplasma, asymmetric up-walled type; arises from vein (under side) and curls in toward leaf forming pocket, blade above gall pressed upward forming umbo as seen from above, gall flattened parallel to blade, 4 mm. long, 2 mm. wide, surface same as leaf or lighter; chamber ovoid, wall thick especially on vein side; abundant on certain trees, Carolina Beach, N. C. Types in collection of writer.

This gall is of especial interest for the reason that it is a striking asymmetric variant of the up-walled type. It appears to be produced by an upgrowth from the vein which instead of being equal on all sides of the larva is distinctly one-sided, resulting in the strongly curled or revolute structure observed. I know of no other gall like it in this respect; it constitutes a new fundamental gall type.

A relatively large itonidid larva was constantly present in the galls.

Chenopodium.

Cecidozoon undetermined. Cecidium nov. Fig. 8.

8. On Chenopolium ambrosiodes var. anthelminticum (L) Gray, stem gall; kataplasma; simple fusiform enlargement of the stem, 1–1.5 cm. long, color and texture same as stem, single chamber elongate, relatively large with irregularly pitted walls; not common, Toledo, O. Types in the collection of the writer.

Cunila.

Cecidomyia sp. (?) Cecidium nov. Fig. 9.

9. On *Cunila origanooides* (L) Britt. (Dittany), bud gall, on ends of aborted upper branches; prosoplasma, up-walled type; subspherical, tipped with short point, 2–3.5 mm. dia., green at first early becoming bluish-purple, surface glandular same as leaves, sessile on branch end, invested below by an involucre of a few inconspicuous, foliaceous bracts; chamber large, same shape as gall,

wall thin, similar to leaf in texture though slightly thicker than leaf; few on any one plant. Martin Co., Ind. Types in collection of writer.

This gall was collected by Mr. Chas. C. Deam, to whom I am indebted for its study.

Gleditsia.

Cecidomyia sp. Cecidium nov. Fig. 10.

10. On *Gleditsia triacanthos* L., leaf rachis; kataplasma; simple elongate swelling of leaf rachis, commonly the secondary axes, 5-10 mm. long, about 1 mm. dia., surface same as normal rachis; monothalamous, the chamber a mere capillary tube; not uncommon, Toledo, O. Types in collection of writer.

Grindelia.

Cecidomyia sp. Cecidium nov. Fig. 11.

11. On *Grindelia lanceolata* Nutt. (Rosin weed), a modification of the floral head; kataplasma, rosette type; a mass of overlapping involucral bracts (each external bract much thicker than normal ones), the whole assuming an ovoid shape, 2.4–3.5 cm. long; single chamber at center surrounded by much reduced bracts, elongate-ovoid; one or few galls on single plant, infrequent; Fayetteville, Ark. Types in collection of writer.

The characteristic salmon-covered larva of the Itonididæ with breast-plate was found in the galls.

Fig. 11, left, shows a normal head and a galled one; right, section of affected head.

Grindelia.

Cecidomyia sp. Cecidium nov. Fig. 12.

12. On *Grindelia squarrosa* (Pursh) Dunal, bud gall; kataplasma; sub-globose with attenuate tip or tips representing aborted leaf elements, 5-8 mm. dia., green, very prominent in axils of normal leaves, 1-4 chambers, each elliptical in outline, walls thick of firm, fleshy texture; not common, Manhattan, Kan. Types in the collection of writer.

Hedeoma.

Cecidomyia sp. (?) Cecidium nov. Fig. 13.

13. On *Hedeoma pulegioides* (L) Pers. (Pennyroyal), a simple

inflated calyx; kataplasma, organoid type; calyx slightly inflated to sub-spherical form, 2 mm. dia., segments but slightly differentiated if at all, yellowish, normal nutlets undeveloped. Rather abundant on specimens of pennyroyal seen. Jeffersonville, Ind. 1-4 larvæ present in galls.

Collected by Mr. Chas. C. Deam.

Fig. 13, upper, normal calyx; lower, affected calyx.

Heterotheca.

Lepidopteron. Cecidium nov. Fig. 14.

14. On *Heterotheca subaxillaris* (Lam.) Britton and Rusby, stem gall; kataplasma; simple fusiform enlargement of stem, 3.5–5 cm. long, about 1 cm. wide, epidermis split into elongate diamond-shaped areas concolorous with stem, chamber relatively large, shape of gall. Not uncommon, Arlington, Texas. Types in collection of writer.

Ilex.

Cecidomyia sp. Cecidium nov. Fig. 15.

15. On *Ilex vomitoria* Ait., leaf; kataplasma, leaf-fold type; a simple fold of leaf along midvein with accompanying thickening of part involved, commonly affecting the terminal leaves in which the largest part of the blade is involved, 3-5 mm. long, 2-3 mm. wide, surface same as normal leaf except color is lighter or where exposed to sun, red tinged; Carolina Beach, N. C. (Fort Fisher) occurring on shrubs exposed to ocean; rather common. Types in collection of writer.

Lepidium.

Cecidozoon undetermined. Cecidium nov. Fig. 16.

16. On *Lepidium virginicum* L., stem or root surface; kataplasma; simple, sub-globular, sessile, at stem base or crown of root. .5–1 mm. dia., yellow, smooth; in each gall a yellow-ovoid egg was found (.2 x .15 mm.) enclosed by the homogenous, pith-like tissues of the gall; Arkansas. Types in collection of writer.

The fact that this gall has developed in the presence of the unhatched egg indicates the stimulus to have originated with the adult cecidozoon at the time of oviposition. I was unable to rear the adults and am unable to assign the gall to any group.

I am indebted to Mr. M. R. Ensign for this material.

Fig. 16, left, galls on stem base; right, included egg.

Liatris.

Cecidomyia sp. Cecidium nov. Fig. 17.

17. On *Liatris punctata* Hook., bud gall; kataplasma; subglobular, consisting of a mass of swollen and fused leaves, the ends of some of them projecting distally from the gall, 5-10 mm. dia., 3-5 elongate larval chambers; not common, Manhattan, Kan. Types in collection of writer.

Lobelia.

Cecidomyia sp. Cecidium nov. Fig. 18.

18. On *Lobelia puberula* Michx., stem swelling; kataplasma; simple rather inconspicuous enlargement of stem, variable in length, the maximum being about 10 cm., width varying from 4-5 mm., surface same as normal stem except for presence of a few longitudinal fissures in the epidermis exposing the cortical layer; internally the pith tissue contains a more or less broken, narrow cavity occupied by the larvae which are distributed in a linear series; all tissues of the stem are about equally involved in the hyperplasia. Not uncommon, Raleigh, N. C. Types in collection of the writer.

I am indebted to Mr. I. V. Shunk for the original collection of this material.

Parthenium.

Eriophyes sp. Cecidium nov. Fig. 19.

19. On *Parthenium integrifolium* L.; leaf-blade gall; kataplasma, diverticulum type with trichomes (erineum); extremely variable evaginations projecting either side of the leaf, the smaller ones covered internally and exteriorly with a heavy layer of tomentum made up of slender, twisted, multicellular trichomes, larger pouches often nearly smooth on exterior. Rather infrequent, West Raleigh, N. C. Types in author's collection.

Fig. 19, left, affected leaf; right, two trichomes.

Persea.

Aphid sp. Cecidium nov. Fig. 20.

20. On *Persea Borbonia* (L) Spreng., leaf; kataplasma, leaf

edge-roll type; rather definite local inrollings (upper side) of leaf edge, wall markedly thicker than ordinary leaf, forming definite cavity, galls variable in size, .4–2 cm. long, 3–10 mm. wide, surface smooth, often glaucous, lighter in color than leaf when young, changing to red and finally black when old; abundant, Wrightsville, N. C. Types in author's collection.

Pinus.

Eriophyes sp. Cecidium nov. Fig. 21.

21. On *Pinus echinata* Mill., bud; kataplasma; rosette type; excessive proliferation of stem buds, the leaves either remain massed in the bud condition or develop in a semi-aborted fashion, forming a dense cluster or rosette; intermediate states are of course found; not uncommon, S. E. Ohio, North Carolina. Types in author's collection.

For the first observed material of this form I am indebted to Mr. J. S. Houser of the Ohio Ex. Station. I have repeatedly collected it in North Carolina. In all collections the mites were demonstrated.

Polygonum.

Coleopteron sp. (?) Cecidium nov. Fig. 22.

22. On *Polygonum aviculare* L. (Bird's Knot Weed), internodal swelling; ovoid enlargement of internode (sometimes involving two internodes), 8-13 mm. long, 3-7 mm. wide, green to reddish brown, surface more coarsely striate than normal stem; chamber large, same shape as gall, walls firm; few on plant; Mt. Vernon, Ind. Types in collection of writer.

This gall was collected by Mr. Chas. C. Deam of Bluffton, Ind. Larvæ taken from the galls were tentatively determined as coleopterous by Professor Z. P. Metcalf of N. C. State College. It is to be hoped this insect may soon be successfully reared, for if it is coleopterous, it will be an interesting addition to the very limited group of gall-making beetles known in America.

Polygonum.

Cecidozoon undetermined. Cecidium nov. Fig. 23.

23. On *Polygonum lapathifolium L.,* leaf edge-roll gall; kataplasma; variable in size and shape, often involving leaf to midrib

roll very tight, yellow in color, contrasting strongly with normal part of leaf. Common locally, Raleigh, N. C. Types in collection of writer.

In the central region of these galls there constantly occurred a white larva without breast-plate. Whether or not these were merely secondary forms in a possible aphid gall was not determined.

Quercus.

Cynips sp. (?) Cecidium nov. Fig. 24.

24. On *Quercus Muhlenbergii* Engelm., leaf; prosoplasma; broadly crescentic or banana-shaped, attached laterally and sessile on under side of leaf, tips attenuate, 2.5 mm. long, 1 mm. wide, smooth, light green, cavity large ovoid not extending into tips, wall thin; not common, Manhattan, Kan. One specimen, type in collection of writer.

Houard describes a similar gall formed on *Q. toza* of Europe by *Trigonospis bruneicornis* Tav. This form differs, however, in bearing long, straggling hairs.

Cynips sp. Cecidium nov. Fig. 25.

25. On *Quercus stellata* Wang., terminal twig swelling; kataprosoplasma; broadly clavate to ovate, 1-2 cm. long, surface similar to normal twig, bud-bearing, monothalamous with false chamber occurring distal to larval cell and opening exteriorly by constricted orifice, false chamber widest near proximal end, lined with thin layer of hard tissue, larval cell ovoid embedded in woody tissue which consitutes the bulk of the gall; not common, Arlington, Tex. Types in the collection of writer.

Amphibolips sp. (?) Cecidium nov. Fig. 26.

26. On *Quercus marylandica* Muench. at node (originates from bud meristem); prosoplasma, radiate-fiber type; balloon-shaped, 1.5–2.25 cm., long axis, green at first, turning yellow when old, not spotted, smooth; larval chamber connected to peripheral zone by relatively few coarse fibers, outer zone or wall very thick (2-3 mm.) and of pith-like consistency, not shrinking when old; fairly common, Arlington, Tex. Types in collection of writer.

The above is comewhat similar to Amphibolips cooki Gillette. It differs in the absence of the red spots, has a thicker wall, is never distally nippled and does not shrivel upon drying. The galls remain on the trees for some time after the leaves have fallen and thus are readily observed in the winter.

Cynips sp. Cecidium nov. Fig. 27.

27. On *Quercus stellata* Wang., leaf petiole; prosoplasma; clustered, appendicular; single galls broadly fusiform, angular below through mutual compression, distally round-conic, 4-7 mm. long, 3-5 mm. wide, reddish brown, puberulent; larval chamber in fall minute, .25 mm. dia., walls correspondingly thick, firm, fleshy, outer half more deeply colored (tannin bearing) than inner half; not uncommon, Arlington, Tex. Types in collection of writer.

These galls are most commonly found on the petiole bases of the terminal leaves, where they occur in such masses as to give a striking aspect to the branch end. They dehisce from the trees in late fall, the larva completing its development through the winter and spring.

Rhus.

Eriophyes sp. Cecidium nov. Fig. 28.

28. On *Rhus canadensis* Marsh, leaf; kata-prosoplasma, diverticulum type; irregularly rounded pocket gall, appendicular, under side, 4-6 mm. dia., green to red, on upper side marked by conic depression filled with trichomes; chamber highly branched, opening into depression, trichomes not abundant within; not uncommon, Manhattan, Kans. Types in writer's collection.

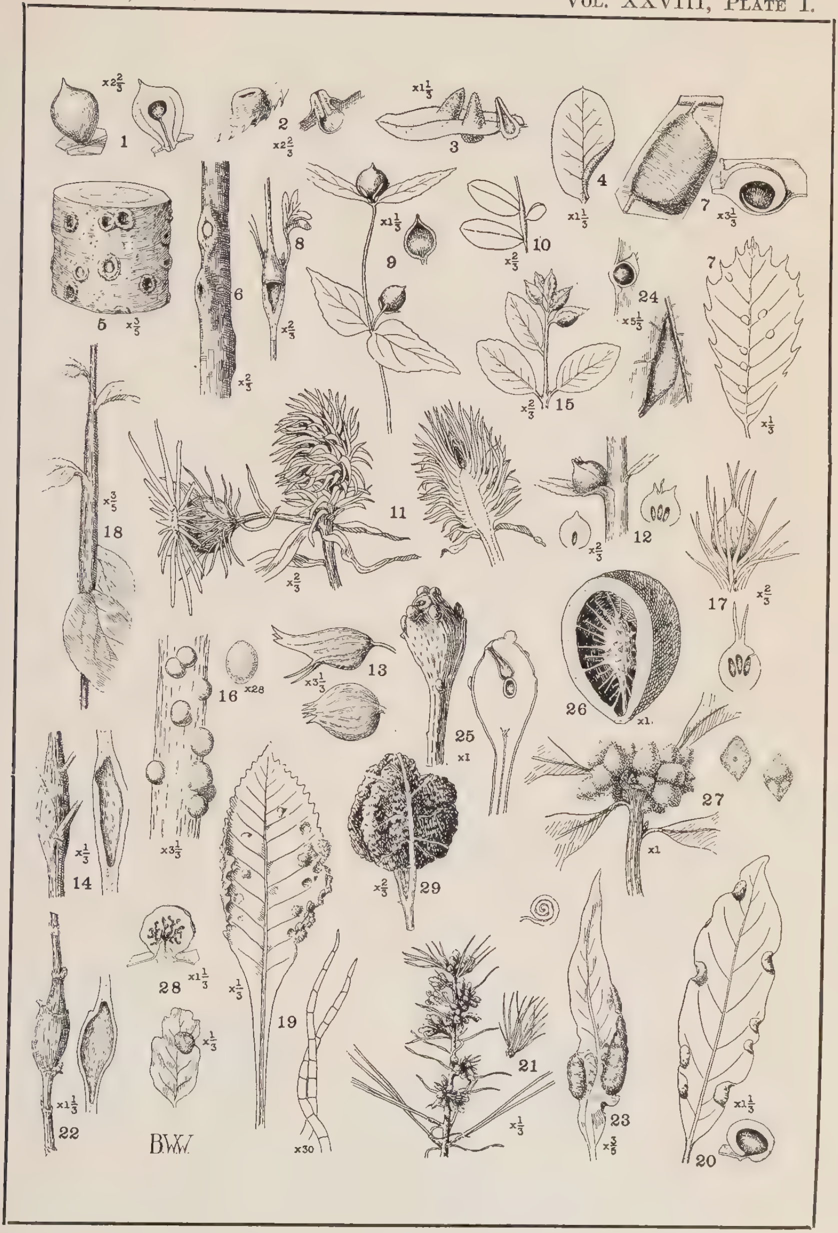
Felt[1] mentions a "cylindric pouch gall" on *R. trilobata* (*canadensis*) from Utah. I have collected this narrow, fusiform type in Kansas. It is sharply and constantly different from the above.

[1] Felt, E. P. Key to Am. Insect Galls. N. Y. State Mus. Bull. 200. 1918.

Solanum.

Cecidozoon undetermined. Cecidium nov. Fig. 29.

29. On *Solanum nigrum* (L.) bud gall; kataplasma, gall consists merely of two highly distorted leaves with their incurled edges tightly appressed, forming a large cavity within. The principal veins are not contorted, this condition being confined to the smaller veins and intervenal tissues which have through slight hyperplasia and hypertrophy grown beyond the normal limits of the principal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23
x3/5
20
x1 1/3
B.W.W.

veins. Infrequent; Fayetteville, Ark. Types in collection of writer.

This curious, primitive gall is evidently formed as follows: The larvæ get into the apical region of the developing stem where they are able to interfere with the normal growth of two very young but definitely formed leaves; the embryonic leaves associated with the apical growing point are suppressed and may be observed in the gall as a compact mass of tissue filling the space between the petioles of the leaves involved in the gall proper.

One or two empty pupa cases of the web type were found in the galls.

Tilia.

Cecidozoon undetermined. Cecidium nov.

30. On *Tilia americana* L., leaf; kataplasma; highly irregular wrinkle and distortion of leaf brought about through inhibition of growth of intervenal tissue; the veins become greatly looped and twisted; not common, Cedar Point, O. Types in the collection of writer.

Within the folds of the distorted leaves were found numerous small white larvæ which apparently were the cause of the galled condition; no evidence whatever of the previous presence of aphids was found.

A NEW ABERRANT FORM OF *VANESSA VIRGINIENSIS* DRURY (HUNTERA FABR.).

By Chas. L. Fox.

The museum of the California Academy of Sciences contains an apparently undescribed variety of *Vanessa virginiensis,* which Mr. E. P. Van Duzee, the curator, has turned over to the writer for description.

Vanessa virginiensis var. *ahwashtee* var. nov.

Upper side. Expanse 43 mm. Primaries: Colors as in typical specimens; fulvous, costal margin, apex and broad outer margin of posterior half blackish; base shaded with olive-brown; apical area marked nearly as in the typical form except that the submarginal line is broader and more suffused; posterior half showing an absence of the black bars found in typical *virginiensis* except for a slight trace in the cubitus$_2$ cell near a submarginal white spot usually found in the typical form. Secondaries: Ground color as in primaries; submarginal row of blue eyelike spots represented by a row of small indistinct white blotches which run into a suffusion of white toward the anterior margin; exteriorly without the submarginal black line found in typical *virginiensis;* fringes as in typical form.

Under side. Primaries: ground color whitish with the olive-brown markings of *virginiensis* much reduced; disk pale apricot-orange, pink in typical form, showing a white spot exteriorly and wanting the black bars of the typical form; base with a double black mark; costa with two black bars, as in *virginiensis.* Secondaries: ground color nearly white; a basal band and two bars on the cell approximate anteriorly, one medial, the other apical, blackish, veined with white; anal area delicately shaded with blackish scales; submarginal eyelike spots characteristic of *virginiensis* much reduced, the anterior almost obliterated; subapical black line heavier than in typical forms; other markings found in *virginiensis* absent.

Described from one male taken by Mr. J. A. Kusche in Golden Gate Park, San Francisco, California, November 11, 1911. Type in collection of the California Academy of Sciences. Named for the Ahwashtee tribe of Indians formerly inhabiting the peninsula of San Francisco.

This variation of *V. virginiensis* corresponds with the form *muelleri* of *Vanessa caryæ* in the markings of the upper surface, while beneath, by its white color, it approaches *Vanessa cardui elymi* Ramb.[1] In the type specimen there is a slight folding of the primaries making the outer margin appear to be too deeply notched below the apex.

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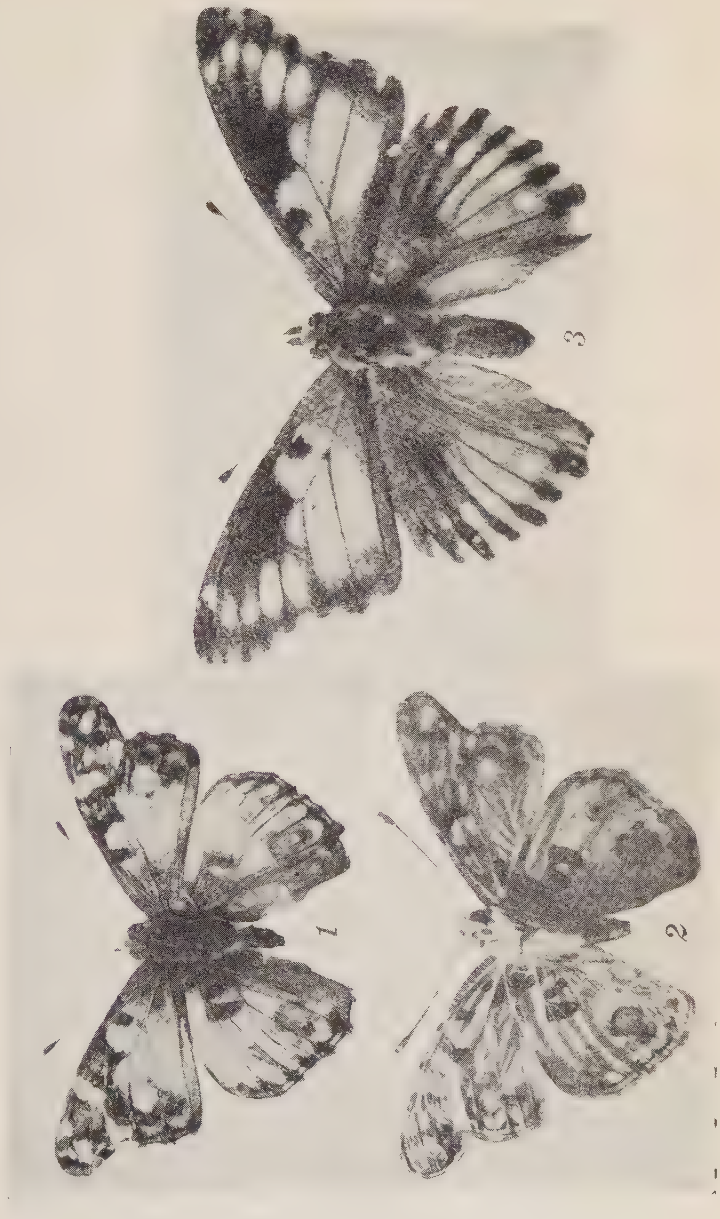
[1] This form is quite distinct from var. fulva Dodge and from the aberration mentioned by Mr. H. M. Simms in Entomological News, XXV, p. 33, 1914.

Explanation of Plate II.

Fig. 1. **Vanessa virginiensis ahwashtee** n. var. Upper side.
Fig. 2. **Vanessa virginiensis ahwashtee** n. var. Under side.
Fig. 3. **Vanessa cardui elymi** Ramb.



Fox—*Vanessa.*

NOTES ON THE SOUTH AMERICAN LACTICAS.

By F. C. Bowditch,
Boston, Mass.

In Psyche, volume xx page 127, is given a list of the Lacticas of the Stanford Expedition to Brazil. One of the chief characteristics of the genus as originally laid out, is the transverse groove of the thorax, abruptly terminated by a longitudinal cut; soon, however, forms turned up where this transverse groove was much modified, then were added forms like *thoracica* Jac. where it was almost wanting, and the longitudinal cut only indicated; then *calcarata* Ill. has a well developed spur on the hind tibia (♂ only), then a species appeared with anterior oblique depressions on the thorax (*impressicollis* Jac.), so that the genus as originally planned has been a good deal modified. Among the species undetermined in the above list are:

rubricata Illig., 1 pair, Para.
debilis Har., 1 Madeira Mamore, No. 2219 Thaxter.
trapezophorus Schf., 1 Porto Velho Rio Madeira, No. 2239 Thaxter.

This last species has two foveae on the front and seems rare in collections—though it may be that what seems a fovea is merely the rear of the not uncommon ocular sulcus, covered somewhat by the withdrawal of the head into the thorax.

Lactica brunneipennis sp. nov.

Oblong, medium sized, head, legs and antennæ black; thorax, body below and elytra bright shining reddish-yellow, the latter on either side, with a wide black longitudinal median stripe, starting from the base and extending nearly to the apex, the dark color especially on the disk, being beautifully shaded into the red ground color.

1 (♂) Rio Madeira, Brazil, Mann and Baker, length 4 mm.

Head impunctate on the vertex, and coarsely punctate in the deep ocular sulcus at the rear of the eye, antennæ reaching a little beyond the middle of the elytra, the basal two or three joints more or less red, second joint short, half the length of the third, that and the fourth about equal, thorax with nearly straight sides and finely punctuate surface, the usual sulci both deep, straight and well defined, elytra very finely and inconspicuously punctulate, and a very obsolete basal depression; the extreme bases of the femora somewhat rufous.

Lactica limbatus sp. nov.

Ovate, small, pale straw yellow, labrum, antennæ (except the base), vertex and neck, and all the edges of the elytra (including the basal and sutural), very dark reddish, piceous black.

♂ and ♀ Porto Velho Rio Madeira, Brabil (Mann and Baker), length 2½–3 mm.

Head finely punctured on the face, very sparsely on vertex, thickly in the ocular sulcus, antennæ 2/3 as long as body, dilute rufous at base, joints 2, 3, 4, increasingly long, thorax with nearly straight sides, surface very finely punctulate, transverse sulcus fairly well marked, the cut-off at the ends as usual better defined and deeper, scutellum pitchy, elytra thickly and finely punctuate, without basal depression, the disk of each elytron of a pale straw color forming a regular oblong spot from base to apex, but not in any place attaining the edges, body below and legs uniformly pale. The elytral markings easily distinguish this form.

Lactica bakeri sp. nov.

Small, elongate parallel, anterior face, antennæ, thorax and legs pale flavous, tinged (especially the latter) with rufous, rear of head, neck and elytra dark violet, body below greenish-black.

5 examples, Porto Velho, Rio Madeira, Brazil (Mann and Beker), length 2¾–3½ mm.

Mouth parts, and antennæ exteriorly, darkened with rufous, vertex with scattered punctures, sulcus of eye more thickly punctate; antennæ reaching a little below the middle of elytra, joints rather stout and flattened, the apex of each joint with stiff hairs, thorax with slightly rounded sides, a few fine punctures on the disk, usual sulci, prominent, deep and straight, elytra parallel, without basal depression sparsely punctulate. The Mexican species *hidalgoensis* Jac. has the same coloration of the elytra but has the head and body below flavous.

Lactica spinifer sp. nov.

Stout, like *calcarata* Ill. or *thoracica* Jac. entirely flavous with black eyes (antennæ except first joint missing), hind tibia with a stout spur-like process (like *calcarata*) placed a trifle behind the middle on the inside.

1 example Chancomayo Thamm (first Jac. coll.), length 4 mm.

Head with a small median fovea, and a few punctures on the front and vertex, thorax sparsely, finely punctulate, sides nearly straight, basal sulcus only moderately deep, the lateral deeply foveate; elytra smooth, polished, sparsely, finely punctulate and with a slight basal depression.

The tibial spur easily distinguishes this form.

In Ann. de Belg. 1893, Mr. Jacoby describes *Lactica thoracica,* a Bolivian form, as having the thorax "without any basal sulcus, the lateral grooves just indicated." My specimen came from Cachabe; it is the best example of the absence of the basal sulcus. Another form with the same characteristic is

Lactica plagiata sp. nov.

Ovate, convex, flavous, palpi, antennæ, legs and breast pitchy black, elytra with a large common blue-black spot from the base to below the middle, leaving a narrow strip of the margin flavous, the rear edge of the spot straight.

3 examples, 2 ♂ 1 ♀, Cachabè l. c. (Rosenberg), length 4-5 mm.

Head with well marked carina between the antennæ, front smooth, except for a few punctures, antennæ reaching below the middle of the elytra, second joint small, the first two joints somewhat testaceous below, thorax with straight sides, smooth and shining above, with a few minute punctures, the basal sulcus barely indicated (it might be called absent), the lateral grooves slightly indented; elytra smooth, convex, lightly punctulate, thickly on the yellow area at the tip. In what I consider the ♀ the hind legs are much more strongly developed than in the ♂ and the apex of the hind tibia is broadened and flattened on the inside. The thoracic structure is almost identical with that of *thoracica* Jac.

Sellata Baly is a well known form, widely distributed in Brazil. A species much resembling it superficially I separate as

Lactica dilatipes sp. nov.

Small, oblong, light straw- yellow, antennæ, except the base, most of the tibæ and tarsi and a common triangular spot on the base of the elytra, dark piceous, hind tibia of ♂ abruptly dilated, inside, near the tip (like some species of Colaspis).

5 ♂ 2 ♀, Salinas Beni R. (Stuart), length 3½–4 mm.

Head with a broad, smooth front, with a few fine punctures, antennæ relatively stout, reaching the middle of the elytra, second joint nearly equal to the third, thorax with nearly straight sides very finely punctulate, sulci well marked, especially the lateral; elytra, smooth, shining, very minutely punctulate, basal depression slight, the dark spot does not cover the scutel, but touches the base in either side, running round under the shoulder, and a straight line across the middle; distinguished from *sellata* by the light legs and dilated ♂ tibia; the punctuation of the ♀ is stronger than the ♂.

Lactica seminigra Jac. P. Z. S. p. 176, is a preoccupied name and should be changed to Rosenbergi. The ♂ hind tibia is ditinctly curved and has a large spur-like process on the inside middle, like *calcarata* Ill. In *thoracica* Jac. what I take to be the ♂ has a well marked dilation of the hind tibia close to the tip.

The general shape of the body and the absence or otherwise of the ocular sulcus may be hereafter an aid in the future arrangement or division of the species of this perplexing group.

ON *PARAPERIPATUS LORENTZI* HORST AND OTHER SPECIES OF THE GENUS FROM NEW GUINEA AND CERAM.[1]

By Charles T. Brues.

Mr. Frederick Muir forwarded to me some time ago three specimens of Peripatus collected by Mr. A. F. Pratt in the Arfak Mountains, Dutch New Guinea.

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[1] Contribution from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 182.

Up to the present time, six species of Onycophora, all belonging to Paraperipatus have been found in New Guinea and the adjacent islands of Ceram and New Britain. In order of their discovery, they are the following:

P. novæ-britanniæ Willey. 1898. New Britain.
P. ceramensis Muir & Kershaw. 1909. Western Ceram.
P. papuensis A. Sedgwick. 1910. Arfak Mts., Dutch North New Guinea.
P. lorentzi Horst. 1910. Wichmann Mts., South Dutch New Guinea.
P. schultzei Heymous. 1912. German New Guinea.
P. stresemanni Bouvier. 1914. Ceram.

With the exception of *P. schultzei* and its variety *ferrugineus*, these have been considered by Bouvier ('14) in an admirable paper which includes a key to species based on type material of *novæ-britanniæ, papuensis, ceramensis* and *stresemanni*. *P. lorentzi* is included in his table from Horst's descriptions ('10 and '11), but *P. schultzei* is not mentioned.

An examination of the specimens send by Muir shows that they are not *P. papuensis,* the type locality of which is the Arfak Mountains, from whence the examples before me also have come. They agree rather closely with *P. lorentzi,* originally discovered in the Wichmann Mountains which lie to the south of the region occupied by the Arfak range. In spite of the several differences detailed below, I have been forced to conclude that two species, *papuensis* and *lorentzi* occur in the Arfak Mountains. Whether the two species occupy a different level, cannot be stated, as there is no indication of altitude on the label attached to the present specimens. However, *papuensis* occurs at an altitude of 3,500 feet, and *lorentzi* was originally found at 9,000 feet, so that it is very probable that the two do not overlap in their distribution.

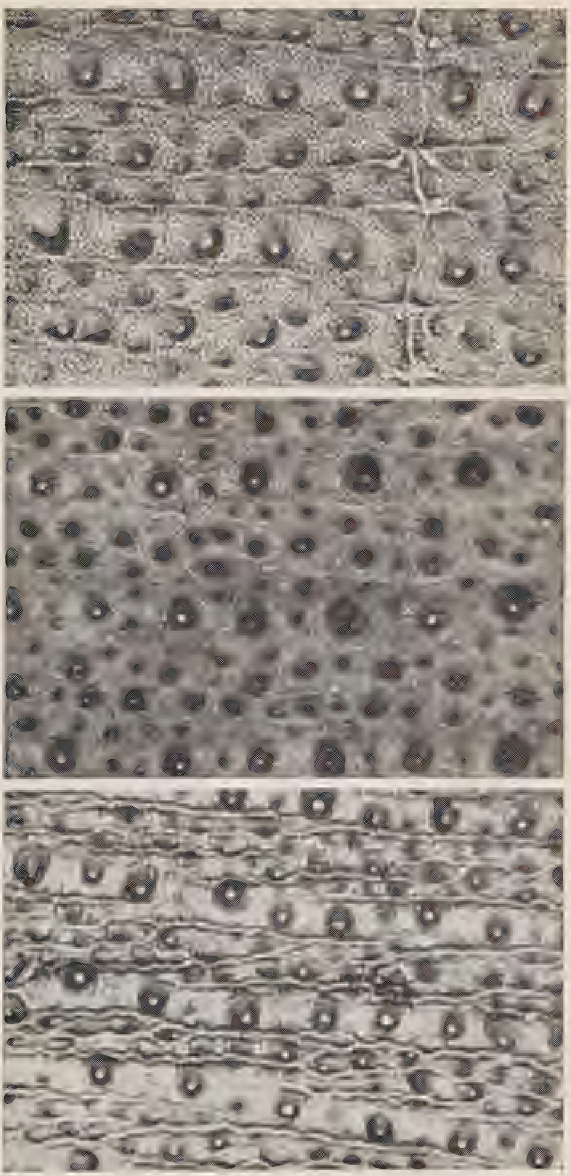
The types of *P. lorentzi* were females with 22 pairs of legs. All three of the present species are also females, each provided with 23 pairs of legs. In the types the transverse body folds are of two types, consisting of broad folds bearing mainly large papillæ, alternating with narrow folds, which are supplied mainly with accessory papillæ. There are five or six folds of each kind to a segment, and the narrow ones sometimes divide or may anastomose with the broad ones. In one of the present specimens such an alternation of broad and narrow folds can be seen, but in the others, and particularly in pieces of integument removed from the body and mounted in balsam under a cover-slip, it is seen that the secondary folds are frequently as broad as the primary ones and that they show much irregularity, division and anastomosis. The middle creeping pad of the legs in the types is twice as broad as the first or the third pad, and in the present examples it varies from one and one-half times the width of the first or third. The nephridial tubercle of the fourth and fifth pairs of legs divides the third creeping pad completely in the type and also in the present specimens, although in one individual these tubercles are abnormally small and do not divide the pad.

Aside from these differences, there seem to be no distinguishing features, and it would seem that two distinct forms cannot be distinguished. It is interesting to note that the specimens at hand approach *P. stresemanni* Bouvier from Ceram in having 23 pairs of legs (23-24 in *stresemanni* and 22 in the typical *lorentzi*) and that the width of the second creeping pad on the leg varies from the size given for *lorentzi* to that given for *stresemanni*.

In the case of the Papuan species, as more are being made known, it is evident that the same difficulties are to be encountered in differentiating species as have already become apparent among the American Onycophora.

While it is apparent that *P. lorentzi* in the Arfak Mountain region approaches the Ceramese *P. stresemanni* in the characters mentioned, it seems improbable that the two species are not distinct, although it is evident that they approach one another very closely.

As no photographs of the integument of *P. lorentzi* have been published, I have prepared some from the finely preserved specimens forwarded by Mr. Muir.



BRUES—*Paraperipatus lorentzi.*

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A NEW GENUS OF TERMITE GUEST FROM FIJI.

By Wm. M. Mann,

Bureau of Entomology, Washington, D. C.

The beetle described below, was collected by the writer on several different islands in Fiji, where individuals occur, one or two to a colony, with a termite (Nasutitermes sp.) common throughout the group and found in dead wood. They were running among the host where the latter were gathered thickest, in a manner common to many species of termitophiles, and similar in habits and behavior to our southern species, *Trichopsenius depressus* Lec.

Coleoptera, Staphylinidæ, Aleocharini.

Lauella gen nov.

Male. (Near Perinthus Casey.) Small, moderately slender. Head, small, not constricted at base, broader than long, sides and occiput convex, vertex flattened. Eyes occupying less than half sides of head, glabrous. Antennæ inserted in rather large and shallow foveæ near interior margin of eye; 11-jointed; first joint three times as long as the third, remaining joints sub-equal in length; joints 3-7 cylindrical, 8-11 compressed, the apical more strongly so than the others. Clypeus submembranous, anterior margin straight. Gula subcampanulate. Labrum twice as long as broad, the anterior border strongly, broadly and triangularly excised at the middle. Mandibles acute at the apex. Submentum and mentum not distinctly divided, together large and sub-quadrangular, with the outer angles rounded. Ligula small, strongly excised apically; paraglossæ not visible. Labial palp thick basally; second joint half as broad as the basal; apical joint less than half as broad as the second. Maxillary palp 4-jointed, basal joint short, second and third joints subequal, the apical slender and much shorter than the third. Pronotum broader than long and a little broader behind than in front, sides strongly convex, anterior and posterior angles evenly rounded and not at all projecting. Elytra strongly transverse, nearly as broad and about two-thirds as long as pronotum, sides inflexed as in pronotum. Metasternum broad, episterna narrow; coxæ contiguous. Abdomen narrower at base than elytra, rather slender and tapering; with six segments visible from above, the first four strongly margined. Legs short and broad; femora and tibiæ rather strongly compressed; femora with short tibial grooves; tibiæ rather broad, tarsi long and slender, 4-jointed on all the legs; claws small.

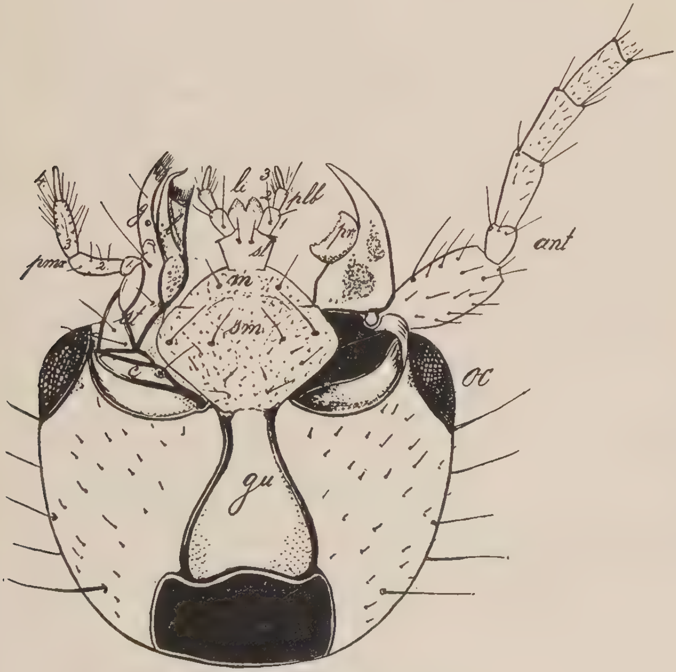

Fig. 1. Head of *Lauella vitiensis* sp. nov.

ant, antennæ; c, cardo; g, galea; gu, gula; l, lacinia; li, ligula; m, anterior part of mentum (fulcrum); oc, eye; plb, labial palpus; pmx, maxillary palpus; pr, prostheca; sl, labial stipes; sm, posterior part of mentum (sub-mentum).

This genus is near *Perinthus* Casey, of which several species, all of termitophilous habit, are known from tropical America. *Lauella* is distinct in having the antennæ more robust, cylindrical at base, and with only the last four joints flattened (much less strongly than in any species of Perinthus), the eyes are not setose and the anterior border of the labrum is very strongly excised at middle. The legs of Perinthus are much less compressed.

In the male of Lauella the last dorsal segment is broadly and triangularly impressed. In the female seven abdominal segments are visible from above.

Genotype.—*Lauella vitiensis* sp. nov.

Lauella vitiensis sp. nov.

Length 2.50–2.75 mm. (Fig. 1.)

Dark brown, border of abdomen and appendages paler. Head, pronotum and elytra strongly shining, abdomen moderately so. Head, thorax and elytra sparsely and finely punctate; hairs widely separated, long and erect. Abdomen above densely, though superficially punctate; with a covering of fine, short and silky recumbent hairs, most sparse on the dorsum, and a series of long hairs which are suberect on the margins and nearly recumbent on the middle of dorsum.

Head less than half as broad as pronotum. Pronotum about one and one-half times as broad as long, broadest behind, sides little convex. Elytra together twice as broad as long, broadest in front, sides nearly straight, posterior border straight. Abdomen gradually tapering, a little longer than the anterior part of the body.

Described from several specimens taken at Vunisea, Kadavu (type locality); Waquava and Tuvuca, in the Fiji Islands.

The accompanying drawing of the under side of the head and the terminology of the same were kindly prepared by Dr. A. Böving.

NEW DIPTERA FROM TEXAS AND MEXICO.

By Charles W. Johnson,
Boston Society of Natural History.

Ulidae

Lepidostola perpolita sp. nov.

Male. Black, face shining, nearly perpendicular, with a slight middle convexity, sides of the face depressed, the depressions and orbits yellowish pruinose, inferior orbit yellow, frontal triangle shining, the upper angle yellow, in a certain light, a narrow orbital line is seen, expanding and forming a spot on each side, narrowly separated from the facial depression, vertical triangle prominent, projecting far above the eyes, occiput shining, antennæ yellow, longer than the face, the first joint longer than the first and second together. Thorax black, with a wide band of bright yellow scale-like tomentum between the shining humeri, a wide arcuate band of the same yellow tomentum in front of the scutellum, between the two bands some scattering yellow scales, pleura and scutellum shining, the latter very prominent, conical and slightly pubescent. Abdomen shining, the first and second segments thinly covered with yellowish hairs. Legs black, shining, bases of all the femora and the tarsi (except the last three joints of the front and the last two on the middle and hind tarsi), yellow. Halteres yellow. Wings yellowish hyaline, the veins, stigma and outer third of the wing slightly darker. Squamæ margined with brown, the lower one fringed with long yellow hairs and the upper one with shorter brown hairs. Length 6 mm.

One specimen, Mexico.

rphidae

Spilomyia texana sp. nov.

Female. Front and face light yellow with a slight brownish facial stripe and a spot on the inferior orbits; vertex and occiput black, and densely pruinose; antennæ yellow. Thorax black, marked with yellow. The humeri fused with large quadrate spots, occupying about two-thirds of the pronotum, leaving a wide black dorsal and transverse band of equal width, the presutural and post-alar callosities yellow, from the latter extend arcuate markings, the ends of which are separated at the suture by the width of the dorsal line of black, a large triangle in front of the scutellum, pleura with spots above the front and middle coxæ, and a large median spot in front of the wing, a large spot is also present on each side of the metanotum, scutellum entirely yellow. Abdomen yellow, the extreme bases of the first to fourth segments black, the median interrupted bands on the second to fourth segments and occupying slightly oblique depressions, are brown, not black. Ventral segments brownish black, margined with yellow. Legs, including the coxæ, yellow, except the outer half of the front tibiæ and all the front tarsi, which are black. Halteres yellow. Anterior of the wing, as far as the fourth vein, clouded with brown, fifth vein widely margined with brown. Length 18 mm.

Round Mountain, Blanco Co., Texas. Allied to *S. hamifera* Loew, and previously looked upon as a variation, but having so many distinguishing characters that it seems worthy of a specific name.

Xylota nebulosa sp. nov.

Male. Face yellow, front brownish, covered with a yellowish pubescence, cheeks brown, vertical triangle and occiput black, shining, antennæ and aristæ black, the third joint round. Thorax bronze black, the humeri whitish pollinose, pleura and scutellum black, somewhat shining. Abdomen black, the first segment shining, the second with two large yellow spots narrowly divided by dorsal line, expanding posteriorly into a large triangle, base margined with black which does not reach the lateral margin, third segment opaque, the side shining, fourth segment metallic green, covered with a yellow tomentum that is longer towards the posterior margin, fifth segment shining black. Venter brownish black, the second segment entirely yellow. Femora and coxæ black, tibiæ and tarsi yellow, the last two joints of the front and middle, and the last three joints of the hind tarsi, blackish, middle of the tibia brown. Halteres yellow. The outer half of the wing clouded with dark brown, base hyaline. Length 9 mm.

One specimen, Texas.

This resembles somewhat the figure and description of *X. pauxilla* Will., but the rounded, not elongated, third antennal joint, the less coarctate abdomen and the more heavily clouded wings, readily distinguish this species.

Ortalididae

Epiplatea dohaniani sp. nov.

Male. Front brown, opaque, sparsely covered with short black hairs, the entire orbital margins whitish, face yellow, cheeks brown and about two-thirds the height of the eye, occiput brown, covered with short black hairs and whitish pruinose, sharply defined at the cheeks, antennæ yellow, arista dark brown, base yellow. Thorax dark brown with short black hair, macrochætæ as in the genotype

(*E. erosa* Loew), pleura whitish pruinose, scutellum and abdomen dark brown, the fourth and fifth segments blackish. Halteres white. Legs light brown. Wings grayish hyaline with the tip beyond the outer cross-band whitish, the inner edge of this band poorly defined, the middle band extending from the costa (between the ends of the first and second veins), across the posterior cross-vein to the tip of the fifth vein, the inner band extending from the end of the auxiliary across the base of the discal cell to the tip of the anal vein, base of the wing yellow. Length 5 mm.

One specimen, collected by Mr. S. M. Dohanian, at Kelley Field, near San Antonio, Texas, April 27, 1918.

Stegana barretti sp. nov.

Female. Face whitish, cheeks brown, shining, front brownish black, opaque, antennæ brown. Thorax, scutellum and abdomen bluish black, shining, sparsely covered with fine black hairs, humeri and a large spot on the pleura below the base of the wing, snow white. Femora and tibiæ black, tarsi yellow. Halteres yellow. Wings hyaline, with a slight yellow tinge. Length 3.5 mm.

Collected at Amecameca, Mexico, Sept., 1900, by Mr. O. W. Barrett.

A SYMBIOTIC ORGANISM IN FULGORIDS.

By F. Muir,
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When working on the natural enemies of the delphacid, *Perkinsiella saccharicida,* in Australia, in the latter part of 1919, I found that about eighty per cent of the eggs of this insect in the field were destroyed, and a fungus always present. At first I took the fungus to be the cause of the destruction of the eggs, but upon further investigation, I found that this was not so, and that these eggs were all punctured and their contents sucked up by a Mirid, *Cyrtorhinus mundulus* (Bred.).

Further observations revealed the fact that the young, adults and eggs of all Delphacidæ contained yeast-like cells very similar to the cells described by Speare in cutworms.* In the adult female *Perkinsiella* these organisms clustered around certain parts of the ovarian tubes and evidently penetrated the walls and entered the eggs where they could always be found congregated in a round mass at the posterior end of the egg. They appear to be held together by a viscid substance, for under a little pressure they flatten out and return to a sphere when the pressure is released. With greater pressure the ball bursts and the cells are dispersed. After the eggs are laid, this mass becomes reddish, due to minute red bodies; during development it works up to the anterior end of the egg and breaks up. Most of the cells appear to be thrown out of the embryo and lie under the egg cap, but a number remain within the embryo and multiply by end-building. After the young leave the egg-shell, the cells remaining within the shell germinate, develop hyphæ, and, if the conditions be favorable, fructify in a similar manner to *Sorosporella uvella* described by Speare.

All the species of Delphacidæ that I examined in Australia contained this organism, but in no species of Ciccadellidæ could I find any. All species of Hawaiian Delphacidæ so far examined contain them, and also *Siphanta acuta,* an introduced Australian fulgorid.

It appears that this organism is in no way inimical to its host. Perhaps it is beneficial, helping it to digest the starches and sugars which form a large percentage of its food.

This note is published in the hope that some student of mycology will make further investigations, work out the life history and identify the fungus.

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* Jour. Agri. Research XVIII. 8, 1920, pp. 399-440.

PROCEEDINGS OF THE CAMBRIDGE ENTOMOLOGICAL CLUB.

The annual meeting was held January 11th. The Secretary reported 11 meetings during the year, with average attendance of 22. Eleven members were elected and the present members number 81. The Treasurer's report showed that $923.28 had been paid for the publication of Psyche, and $943.06 received from subscribers. $58.00 had been received from assessments and $56.42 paid for general expenses. The editor of Psyche reported that the magazine had been reduced in size and 161 pages published, with a small number of illustrations which had been paid for by contributors.

The following officers were elected for 1921:

President	Nathan Banks.
Vice-President	L. R. Reynolds.
Secretary	J. H. Emerton.
Treasurer	F. H. Walker.
Executive Committee	C. A. Frost, A. P. Morse, P. G. Bolster.

Prof. Brues, who had attended the entomological meetings of the American Association for the Advancement of Science at Chicago, gave an account of the proceedings. Prof. Wheeler gave an account of a visit to the entomologists at the University of Illinois.

Mr. A. P. Morse showed several grasshoppers and froghoppers especially abundant on the grass, *Andropogon scoparius,* widely distributed along the sea coast.

Mr. R. H. Howe, Jr., showed a diagram of the elevations of land in New England used for plotting the vertical distribution of insects.

Mr. Varás who had attended club meetings for the past three years and was about to return to his home in Chile, asked for correspondence and exchange of specimens.

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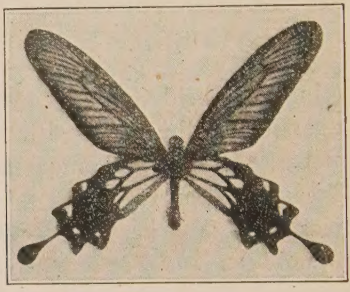

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